

ACMS Requirements Based on Common PDM System Characteristics

	Capability/Feature	Description	Source
	<i>User Functions</i>		
1	Data Vaulting		
1.1	Secure data storage	The ACMS shall provide for secure storage of product data sets in accordance with defined access control permissions and rules (see Access control and User authorization management). Secure storage is defined as the ability to preclude stored information from being viewed, reused, updated, or deleted without invoking system rules.	CIMData PDM Buyer's Guide (with extensions)
1.2	Types of stored data	ACMS shall provide the ability to store data sets which include product data files and/or documents (native or standard formats), metadata associated with managed product data, administrative data, references to data external to ACMS, records in an associated database, and electronic forms such as Engineering Change Proposal (ECPs).	CIMData PDM Buyer's Guide (with extensions)
1.3	Access control		
1.3.1	Rules application	The ACMS shall provide for checking the identity and authorizations of users and restrict access as defined by access control permissions and rules (see User authorization management).	CIMData PDM Buyer's Guide (with extensions)
1.3.2	Function access	The ACMS shall suppress functions not currently available to a user due to location in the menu tree or access restrictions.	BDM
1.3.3	User feedback	ACMS shall provide a message box to notify a user that has been denied access to controlled files.	BDM
1.3.4	Rule types	Rules shall be based on user identity and defined needs, user role, file type, or data release status.	VPSCii Guide (with extensions)
1.3.5	Authorization monitoring & blocking	ACMS shall provide for monitoring requests for data and blocking or granting requests based on established permissions and access control rules.	VPSCii Guide (with extensions)
1.3.6	Check-in data		
1.3.6.1	Check-in control	ACMS shall provide for moving files or information (e.g., database records) from a user's workspace to the vault in accordance with user or file permissions in such a way that created, modified, or promoted data is placed under the security, access, change, and release control of the PDM system.	CIMData PDM Buyer's Guide & VPSCii Guide
1.3.6.1	Hidden data location	ACMS shall be implemented in such a way that the user does not need to know the physical location of the checked-in data.	CIMData PDM Buyer's Guide & VPSCii Guide
1.3.7	Check-out data		
1.3.7.1	Check-out control	ACMS shall provide for moving files or information (e.g., database records) from the vault to an authorized user's workspace.	CIMData PDM Buyer's Guide & VPSCii Guide

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1.3.7.2	Lock files	ACMS shall provide for files and information to be locked and prevent multiple users from attempting to modify the data simultaneously.	CIMData PDM Buyer's Guide & VPSCii Guide
1.3.7.3	Copy checked-out files	ACMS shall allow users to view and modify a copy of the data which has been checked-out by another user. This would create a separate instance of the data.	BDM
1.3.7.4	Simultaneous check-out	If ACMS allows data check out to multiple users simultaneously, then ACMS shall provide a mechanism for controlling and consolidating changes to data which is checked-out simultaneously to multiple users.	Metaphase
1.3.7.5	View user of checked-out item	ACMS shall provide the ability to view which user has checked-out items from the vault.	BDM
1.3.7.6	Hidden data location	ACMS shall allow the user to check-out data from the vault without knowing its specific location within the vault.	CIMData PDM Buyer's Guide & VPSCii Guide
1.4	Metadata management		
1.4.1	Metadata maintenance	ACMS shall provide for updating metadata so that the effects of changes, release levels, approval authorizations, and other data controls are implemented. (Examples of metadata include identification and location of data, keywords, ownership, approval authorizations, release levels, and data format.)	CIMData PDM Buyer's Guide & CIMData PDM Definition Brochure (with extensions)
1.4.2	Metadata tracking	ACMS shall provide for examining metadata to determine its current status and to examine the history of changes to metadata elements.	CIMData PDM Buyer's Guide & CIMData PDM Definition Brochure (with extensions)
1.5	Data Locating		
1.5.1	Classification		
1.5.1.1	Classification grouping	ACMS shall have the capability to create classification groupings that are defined by a minimum set of required attributes. Each class will have a different set of required attributes.	CIMData PDM Buyer's Guide & VPSCii Guide (with extensions)
1.5.1.2	Hierarchical Classification	ACMS shall provide the ability for classifications to be arranged hierarchically.	CIMData PDM Buyer's Guide & VPSCii Guide
1.5.2	Search		
1.5.2.1	Hierarchical search	ACMS shall provide the capability to search product structures hierarchically for product data.	CIMData PDM Buyer's Guide & CIMData PDM Definition Brochure (with extensions)

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1.5.2.2	Searching values	ACMS shall provide the ability to search product data attributes for specific values, ranges of values, and logical combinations using Boolean operations.	CIMData PDM Buyer's Guide & CIMData PDM Definition Brochure (with extensions)
1.5.2.3	Search queries	ACMS shall allow for storing and retrieving queries and for creating ad-hoc queries.	CIMData PDM Buyer's Guide & CIMData PDM Definition Brochure (with extensions)
1.5.2.4	Query format	ACMS shall allow for fill-in-the-blank and command line queries.	BDM
1.5.2.5	Retrieve search item	The ACMS shall provide the capability to retrieve items resulting from the search without additional navigation.	BDM
1.5.3	Data links and relationships		
1.5.3.1	Use of data links	ACMS shall provide for the establishment, navigation, and maintenance of links (relationships) between product data. The links associate product data to its data of origin, earlier versions or revisions, and approved changes.	CIMData PDM Buyer's Guide (modified)
1.5.3.2	Creations of data link types	ACMS shall provide the capability to create, revise, update and delete new data link types which describe relationships between product data.	BDM
1.5.3.3	Links between product structure and product data	ACMS shall provide for the establishment of links between product structure elements and product data.	CIMData PDM Buyer's Guide (modified)
1.5.3.4	Link rules	ACMS shall provide the capability to implement rules which govern the behavior of links (e.g. types of data which can be associated with a particular link type).	BDM
1.5.3.5	Link version compatibility	The ACMS shall automatically track and maintain proper version compatibility for linked members of a data set.	VPSCii Guide & CIMData PDM Buyer's Guide (with extensions)
1.5.4	Product configuration navigation	ACMS shall provide a means for viewing a product's configuration via the links established between product structure elements. This in turn is used to find a specific item within the product's configuration. In other words, navigation uses the links as a means to view a product configuration which in turn is used to find a specific item within the product's configuration.	VPSCii Guide & CIMData PDM Buyer's Guide (with extensions)
1.6	Electronic approvals	ACMS shall provide for electronic indication of approval along with the name of the approver and a date and time stamp. This can be used for such processes as Engineering Change Proposal (ECP) approvals, access approvals, release approvals, indication of task completion.	VPSCii Guide

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1.7	Release management	ACMS shall provide for electronic indication of data versions and release status.	CIMData PDM Buyer's Guide & CIMData PDM Definition Brochure
1.8	File status history		
1.8.1	Record history	ACMS shall provide for recording changes in file or information status. This is often accomplished via event logs.	VPSCii Guide (with extensions)
1.8.2	View history changes	ACMS shall provide the ability to view records of file or information status changes.	VPSCii Guide (with extensions)
2	Workflow & process management		
2.1	Workflow administration		
2.1.1	Pre-defined workflow definition	ACMS shall provide the ability to define and save pre-defined workflow templates that automate regular and repeatable processes.	CIMData PDM Buyer's Guide & VPSCii Guide (with extensions)
2.1.2	Ad hoc workflow definition	ACMS shall provide the ability to define ad hoc workflows that automate ad hoc processes.	CIMData PDM Buyer's Guide & VPSCii Guide (with extensions)
2.1.3	Workflow steps	Both predefined and ad hoc workflows shall be capable of incorporating sequential, parallel, and conditional steps.	CIMData PDM Buyer's Guide & VPSCii Guide (with extensions)
2.1.4	Workflow rules	Both predefined and ad hoc workflows shall support specifying voting, routing, and time-out rules.	CIMData PDM Buyer's Guide & VPSCii Guide (with extensions)
2.1.5	Action trigger	Both predefined and ad hoc workflows shall support defining action triggers.	CIMData PDM Buyer's Guide & VPSCii Guide (with extensions)
2.1.6	Event notification	Both predefined and ad hoc workflows shall be capable of generating and disseminating event notifications.	CIMData PDM Buyer's Guide & VPSCii Guide (with extensions)
2.1.7	Workflow alteration	ACMS shall provide authorized users with the ability to alter pre-defined or ad hoc workflows as the need arises.	CIMData PDM Buyer's Guide & VPSCii Guide (with extensions)

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2.1.8	Folder/package assembly & maintenance	ACMS shall provide the ability to identify and associate product data files or file representations with a workflow.	CIMData PDM Buyer's Guide & VPSCii Guide (with extensions)
2.1.9	Workflow information authorization restrictions and expansions	ACMS shall provide the capability for workflow owners/creators to restrict or expand information authorizations as part of the workflow.	BDM (vendor discussions)
2.1.10	Types of workflow authorizations	ACMS shall permit workflow information authorization restrictions or expansions to be specified by role, user, group, or item status where item refers to the object about which information is being provided.	BDM (vendor discussions)
2.1.11	Workflow tracking & monitoring	ACMS shall provide the ability to determine the progress of a workflow and to monitor the workload of resources associated with multiple workflows.	BDM (vendor discussions)
2.1.12	Notification of late task	ACMS shall provide electronic notification of tasks that have not been completed prior to the due date. Notification will be to the user that initiated the workflow task.	BDM (vendor discussions)
2.1.13	Workflow history & audit	ACMS shall provide for capturing information on the performance of a workflow and to review the events and results associated with the workflow.	CIMData PDM Buyer's Guide & VPSCii Guide (with extensions)
2.2	Workflow routing	ACMS shall provide to authorized users the ability to route files or file representations through a defined workflow.	VPSCii Guide
2.3	Event triggers	ACMS shall provide for the initiation of a workflow step based upon the occurrence of a pre-defined event.	VPSCii Guide (with modifications)
2.4	Workflow messaging & notification	ACMS shall provide for the distribution of folders or packages and the transmission of notifications.	CIMData PDM Buyer's Guide
2.5	Task or product electronic sign-off	ACMS shall provide for electronic indication of approval or authorization. This can be used to signify task completion or product sign-off.	VPSCii Guide
3	Product structure management		
3.1	Product structure creation & maintenance		
3.1.1	New structure elements	ACMS shall provide for the creation and association of new structure elements such as assemblies, components, and parts for newly designed items.	CIMData PDM Buyer's Guide
3.1.2	Hierarchical structure	Product structure representations within ACMS shall be hierarchical.	CIMData PDM Buyer's Guide
3.1.3	Graphically displayed	ACMS shall graphically display product structures.	CIMData PDM Buyer's Guide
3.1.4	Version establishment & maintenance	ACMS shall provide for the establishment, recording, and maintenance of the version for a given part, component, or assembly.	CIMData PDM Buyer's Guide (with modifications)

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3.1.5	Multiple versions	ACMS shall accommodate multiple versions of a part, component, or assembly.	CIMData PDM Buyer's Guide (with modifications)
3.1.6	Effectivity specification & maintenance	ACMS shall provide the ability to specify and maintain information on when a part version is valid for use in assembling a particular version of a product.	CIMData PDM Buyer's Guide
3.1.7	Multiple effectivity schemes	ACMS shall support multiple effectivity schemes within a product structure to include specifying effectivity by serial number, production date, or lot.	CIMData PDM Buyer's Guide
3.1.8	Substitute or option specification	ACMS shall provide the ability to identify part options (alternative or substitute parts) for a part, component, or assembly.	CIMData PDM Buyer's Guide
3.1.9	Product structure element maintenance	ACMS shall allow adding or deleting specific parts or components in an assembly or product structure.	CIMData PDM Buyer's Guide
3.1.10	Product structure version, effectivity, and option maintenance	ACMS shall provide the capability to revise product structures through the ability to add, delete, or otherwise modify part or assembly versions, effectivities or option indications (alternative or substitute parts).	CIMData PDM Buyer's Guide (with extensions)
3.1.11	Aggregate changes of status	The ACMS shall provide the capability to change the release or baseline status of a group of product structure elements by changing the status of its parent.	BDM
3.2	Product structure search & access		
3.2.1	Product structure navigation	ACMS shall provide the ability to navigate through an on-screen graphical representation of the product structure or configuration in order to locate a specific item.	CIMData PDM Buyer's Guide
3.2.2	Where-used locating	ACMS shall provide the ability to find where a part is used in this or other assemblies or products.	CIMData PDM Buyer's Guide
3.2.3	Assembly parts locating	ACMS shall provide the ability to determine what other parts are used in a given assembly.	CIMData PDM Buyer's Guide
3.3	Multiple product structure views		
3.3.1	Multiple product structure views	ACMS shall provide the ability to develop, display, and print various views of a product structure. Example views include a designers view, a manufacturers view, and a program manager's view.	CIMData PDM Buyer's Guide (modified)
3.3.2	Multiple product structure reports	ACMS shall provide the ability to print various product structure reports. Example reports include Assembly Parts List Report, Indented Bill of Material Report, Where-Used Parts List Report, Part Information Report, Part Revision History Report, Part Vendor Relationships Reports, and Part Family Relationships Report.	CIMData PDM Buyer's Guide (modified)
3.4	Product structure authorizations	ACMS shall provide the ability to specify authorizations for accessing, creating, and modifying product structures.	CIMData PDM Buyer's Guide
4	Program management		
4.1	Work breakdown structure creation & maintenance	ACMS shall provide for the development and maintenance of a project work breakdown structure (WBS) and allow users to relate ACMS controlled items and product structures to the WBS tasks.	CIMData PDM Buyer's Guide

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4.2	Schedule development & progress monitoring	ACMS shall provide the ability to establish schedules for WBS tasks and determine the status of tasks as well as the status of ACMS controlled items associated with the tasks.	CIMData PDM Buyer's Guide
4.3	Resource assignment & tracking	ACMS shall provide the ability to assign resources to tasks and track the expenditure of those resources.	CIMData PDM Buyer's Guide
	<i>Utility functions</i>		
5	Communications & messaging		
5.1	General message exchange	The ACMS shall provide for the ad hoc exchange of information electronically. This can be accomplished either with an embedded e-mail capability or via an interface with the following e-mail systems: TBD.	CIMData PDM Buyer's Guide & CIMData PDM Definition Brochure (modified)
5.2	Message routing	ACMS shall be able to route e-mail messages to multiple destinations.	CIMData PDM Buyer's Guide & CIMData PDM Definition Brochure
5.3	Automatic notification triggering	The ACMS shall provide the ability to automatically generate notification messages based upon event triggers.	CIMData PDM Buyer's Guide & CIMData PDM Definition Brochure
5.4	Message management	The ACMS shall provide the ability to manage messages by providing capabilities such as in-boxes, out-boxes, message prioritization, and message binning (folders), archiving, and deletion.	CIMData PDM Buyer's Guide & CIMData PDM Definition Brochure (with extensions)
6	Data exchange (transport & translation)		
6.1	Transport data		
6.1.1	File copy or movement on request	The ACMS shall provide the ability to copy or move files from secure data storage to a user's application workspace in response to a user request.	CIMData PDM Buyer's Guide
6.1.2	File copy or movement in response to an application	The ACMS shall provide the ability to copy or move files from secure data storage to a user's application workspace based upon a request from the following applications: TBD	CIMData PDM Buyer's Guide (modified)
6.1.3	File copy or movement in response to an event trigger	The ACMS shall provide the ability to copy or move files from secure data storage to a user's application workspace in response to a pre-defined event trigger or workflow prompt.	CIMData PDM Buyer's Guide
6.1.4	File translation scheduling or initiation	The ACMS shall provide the ability to schedule and route files to appropriate file translators, apply default settings for translations, initiate the translation, and route the output file to the user.	CIMData PDM Buyer's Guide

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6.1.5	Electronic systems interfacing	The ACMS shall provide the ability to exchange data with the following existing repository, PDM, configuration management, and CITIS systems: TBD.	BDM
6.1.6	Data transport transaction recording	The ACMS shall provide for recording information about the data transport transaction within the PDM system. For example, ACMS should record the time, initiator, and recipient of the transaction.	CIMData PDM Buyer's Guide (modified)
6.2	Translate data		
6.2.1	Automatic translator application in response to triggers	The ACMS shall provide for automatic translation of files to pre-specified formats in response to event triggers or workflow prompts.	CIMData PDM Buyer's Guide
6.2.2	Translator application in response to user requests	The ACMS shall provide for file translation to user specified formats in response to user requests.	CIMData PDM Buyer's Guide
6.2.3	User modifiable default translation parameters	The ACMS shall provide default translation parameters (e.g., destination file location and name, data type, translation format, etc.) that may be modified by the user.	CIMData PDM Buyer's Guide (with modifications)
6.2.4	Translator list & format mapping	The ACMS shall provide a list of translators accessible via ACMS and the formats it accepts and creates.	CIMData PDM Buyer's Guide (with modifications)
7	Imaging services		
7.1	Viewable image creation	ACMS shall support the creation and use of viewable images that employ one or more of the following viewing software: TBD.	BDM
7.2	Additional viewer packages	The ACMS shall support the integration of additional viewer packages beyond those originally specified.	BDM
7.3	Viewable image control	The ACMS shall provide the capability of placing the viewable images under ACMS control (see Data Vaulting).	CIMData PDM Buyer's Guide
7.4	Viewable image red-line or mark-up & annotations	The ACMS shall provide the ability for multiple reviewers to red-line, mark-up, and provide annotations to viewable images.	CIMData PDM Buyer's Guide (with extensions)
7.5	Distinct red-line	ACMS shall ensure that individual reviewer red-lines and annotations are kept distinct.	CIMData PDM Buyer's Guide (with extensions)
7.6	Red-lined, annotated, & edited image management	The ACMS shall provide the ability to place the red-lined, annotated, & edited viewable images under ACMS control (see Data Vaulting).	CIMData PDM Buyer's Guide & VPSCii Guide
8	System administration		
8.1	Metadata defaults	The ACMS shall provide the system administrator with the ability to establish and modify metadata defaults.	CIMData PDM Buyer's Guide
8.2	User authorization management		

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8.2.1	Parameters for the access rule set	ACMS shall include the following access rule set parameters: information type, data release and baseline status levels, type of access, classification and sensitive data limitations, distribution limitations, maximum allowable number of unsuccessful or improper access attempts, and the authorized user's security clearance, organization, location, and ACMS access authorizations and profile.	Crusader Performance Spec (with modifications)
8.2.2	Establish user information	The ACMS shall enable the system administrator to establish and modify read, write, copy, and modify permissions and rules for individual users, groups of users, or file types.	CIMData PDM Buyer's Guide (with modifications)
8.2.3	Update/delete user information	ACMS shall enable the system administrator to update user information including permissions and rules and delete a user.	CMIS SRS
8.2.4	Password entry	ACMS shall require the user to enter a password to access the system.	CMIS SRS
8.2.5	Password modification	ACMS shall the capability for the user to change a his or her password.	CMIS SRS
8.2.6	Assignment to roles	ACMS shall provide the capability to assign users to specific roles.	BDM
8.2.7	Modify role assignment	ACMS shall provide the capability to modify role assignments.	BDM
8.2.8	Create, modify, delete roles	ACMS shall provide the capability to create, modify, and delete roles.	BDM
8.2.9	Restrict access by roles	ACMS shall provide the capability to restrict data access to users assigned specific roles.	BDM
8.2.10	Assignment to groups	ACMS shall provide the capability to assign users to specific groups.	BDM
8.2.11	Modify group assignments	ACMS shall provide the capability to modify group assignments.	BDM
8.2.12	Create, modify delete groups	ACMS shall provide the capability to create, modify, and delete groups.	BDM
8.2.13	Restrict access by groups	ACMS shall provide the capability to restrict data access to users assigned to specific groups.	BDM
8.2.14	Restrict access by specific users	ACMS shall provide the capability to restrict data access privileges to specific users. Example of access privileges include: view, modify, delete, and create.	BDM
8.3	Data distribution management	The ACMS shall enable the system administrator to maintain, coordinate, and synchronize a distributed data environment (multiple sites, multiple servers, multiple networks, multiple repositories, multiple PDM systems, etc.).	CIMData PDM Buyer's Guide (with modifications)
8.4	Archive, backup, & restore management		
8.4.1	Create archive & back-up	The ACMS shall provide the system administrator the ability to establish and maintain archives and backups.	CIMData PDM Buyer's Guide & VPSCii Guide
8.4.2	Restore system	ACMS shall provide the system administrator the ability to restore the system using backups.	BDM
8.4.3	Request for archive	ACMS shall provide the user with the capability to request that data be placed in and retrieved from off-line archival storage.	Crusader Performance Spec
8.5	External systems interface management	The ACMS shall provide the system administrator with the ability to establish interfaces with the following systems: TBD	BDM

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8.6	Administration interface layout tailoring	The ACMS shall provide the system administrator with the capability to customize the user interface.	CIMData PDM Definition Brochure
8.7	System message & terminology tailoring	The ACMS shall provide the system administrator with the capability to customize the system messages and terminology.	CIMData PDM Definition Brochure
8.8	Third-party applications integration		
8.8.1	Application launching	The ACMS shall enable the system administrator to incorporate triggers that result in launching user applications based on events, user actions, or times.	CIMData PDM Definition Brochure (modified)
8.8.2	ACMS system function invoking	The ACMS shall provide to the system administrator the capability to include procedure calls in user applications that invoke selected ACMS system functions from the user application without requiring the user to exit his or her application. This could be done using a published ACMS API.	BDM
8.8.3	Metadata sharing	The ACMS shall provide to the system administrator the capabilities that permit sharing of ACMS controlled metadata with other systems.	CIMData PDM Definition Brochure (modified)
8.9	Adding new functionality	The ACMS shall provide to the system administrator the capability to add new functionality to ACMS including defining new metadata elements and associating them with objects and defining queries and reports.	BDM
8.10	System security & monitoring		
8.10.1	Establish security controls	The ACMS shall provide capabilities that enable the system administrator to establish security controls and monitor the system for security violations.	BDM
8.10.2	Contamination control	ACMS shall provide controls to protect the system and data from contamination by unauthorized computer programs or data such as viruses.	Crusader Performance Spec
8.10.3	File name encryption	ACMS shall encrypt the names of file with restricted access to preclude accessing these files directly through the operating system without using the ACMS interface	BDM
	User interface		
9	Ease of use		
9.1	Performing an operation	The ACMS user interface will be easy to use in terms of the number of steps required to perform an operation, the order of steps, and the amount of automatically transferred information.	CIMData PDM Buyer's Guide
9.2	Learn and re-learn	The ACMS user interface will be easy to learn and re-learn.	CIMData PDM Buyer's Guide
9.3	Customize/Tailor	The ACMS shall provide the ability to customize/tailor the user interface to meet user needs.	CIMData PDM Buyer's Guide
10	On-line support		
10.1	Help on context items	The ACMS user interface shall provide context sensitive, on-line help to users.	CIMData PDM Buyer's Guide

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10.2	Interactive help	ACMS user interface shall provide interactive help to users, via searching on key words.	CIMData PDM Buyer's Guide
10.3	On-line documentation	The ACMS user interface shall provide users the ability to view system documentation on-line.	CIMData PDM Buyer's Guide
11	User interface styles		
11.1	Graphical user interface	The predominate ACMS user interface shall be a graphical point and click user interface based on GUI standards such as OSF/Motif or MS-Windows.	CIMData PDM Buyer's Guide (with modifications)
11.2	Forms-based user interface	When it is necessary to enter or display numerous data elements on a single item or for a single transaction, the ACMS user interface shall provide a graphical forms-based interface in which defaults are provided that the user may override via pick lists or typed entries.	CIMData PDM Buyer's Guide (with modifications)
11.3	Menu-driven user interface	When it is necessary for the user to select among hierarchical operations or options, the ACMS user interface shall provide a graphical hierarchical menu driven user interface.	CIMData PDM Buyer's Guide (with modifications)
11.4	Command-line user interface	In a few select instances in order to short-cut to an operation or option, the ACMS user interface shall provide for command-line instructions directly from the user.	CIMData PDM Buyer's Guide (with modifications)
12	Web-based Access		
12.1	Web-based login	Remote authorized users of data shall be able to login to the ACMS through a web-browser user interface.	BDM
12.2	Search/browse for particular part, component, or product assembly	The browser interface shall enable the user to search/browse ACMS for a particular part, component, or product assembly.	BDM
12.3	Web-based data retrieval	The browser interface shall enable the user to identify and retrieve (to include check-out) engineering data associated with an assembly, component, or part.	BDM
12.4	Web-base imaging services	A user accessing ACMS from the web via a COTS browser shall be able to view and redline viewable images provided by ACMS.	BDM
12.5	Web-based workflow	A user accessing ACMS from the web via a COTS browser shall be able to build ACMS workflows, monitor workflows, receive and perform tasks, receive data associated with tasks, and send and receive messages.	BDM